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What is claimed is:

1           1.     In a gas generating device wherein a fuel material reacts to  
2     generate gas, the improvement comprising:

3     a first chamber having contents including a quantity of a water-supplying compound  
4     and a quantity of a fuel precursor, the fuel precursor being water reactive; and

5           an initiator in discharge communication with at least a portion of the  
6     quantity of water-supplying compound content of said first chamber to form water,  
7     with at least a portion of the formed water reacting with at least a portion of the  
8     quantity of fuel precursor to form a quantity of the fuel material and resulting in  
9     opening of said first chamber with a release of at least a portion of the fuel material  
10    therefrom.

1           2.     The gas generating device of claim 1 wherein the first chamber  
2     contents include at least a portion of the quantity of water-supplying compound and  
3     at least a portion of the quantity of the fuel precursor stored in direct contact.

1           3.     The gas generating device of claim 2 wherein, in a static state, the  
2     first chamber is closed, the gas generating device additionally comprising:

3           a second chamber in fluid communication with said first chamber upon  
4     the opening of said first chamber, said second chamber containing a quantity of  
5     pressurized stored gas including a quantity of oxidant material, with at least a portion

6 of the fuel material released from said first chamber reacting with at least a portion of  
7 the oxidant material to form product gas, said second chamber adapted to open to emit  
8 at least a portion of the product gas therefrom.

1 4. The gas generating device of claim 1 wherein in an at rest  
2 condition, the quantity of water-supplying compound is stored segregated from the  
3 quantity of the fuel precursor within said first chamber.

1 5. The gas generating device of claim 4 wherein, in a static state, the  
2 first chamber is closed, the gas generating device additionally comprising:

3 a second chamber in fluid communication with said first chamber upon  
4 the opening of said first chamber, said second chamber containing a quantity of  
5 pressurized stored gas including a quantity of oxidant material, with at least a portion  
6 of the fuel material emitted from said first chamber reacting with at least a portion of  
7 the oxidant material to form product gas, said second chamber adapted to open to emit  
8 at least a portion of the product gas therefrom.

1 6. The gas generating device of claim 1 wherein the first chamber  
2 is defined at least in part by a perforated housing.

1           7.     The gas generating device of claim 6 additionally comprising a  
2 second chamber in fluid communication with said first chamber, said second chamber  
3 containing a quantity of pressurized stored gas including a quantity of oxidant  
4 material, with at least a portion of the fuel material released from said first chamber  
5 reacting with at least a portion of the oxidant material to form product gas, said second  
6 chamber adapted to open to emit at least a portion of the product gas therefrom.

1           8.     The gas generating device of claim 7 additionally comprising a  
2 liner within the first chamber perforated housing, the liner maintaining the first  
3 chamber contents in discharge communication proximity with the initiator device.

1           9.     The gas generating device of claim 1 wherein the fuel precursor  
2 is at least one metal element-containing material selected from the group consisting  
3 of:  
4 hydrides, carbides, alkoxides and combinations thereof.

1           10.    The gas generating device of claim 1 wherein the fuel precursor  
2 comprises a metal alkoxide.

1           11.    The gas generating device of claim 10 wherein the fuel precursor  
2 comprises an alkali metal.

1                   12.    The gas generating device of claim 10 wherein the fuel precursor  
2 comprises an alkaline earth metal.

1                   13.    The gas generating device of claim 1 wherein the fuel precursor  
2 comprises at least one first component selected from the group of metals and  
3 organometallic compounds and at least one second component selected from the group  
4 of carbonates and bicarbonates.

1                   14.    The gas generating device of claim 1 wherein the fuel precursor  
2 comprises potassium t-butyl carbonate.

1                   15.    The gas generating device of claim 1 wherein the water-supplying  
2 compound comprises ammonium nitrate.

1                   16.    The gas generating device of claim 1 wherein the water-supplying  
2 compound comprises an inorganic compound with stabilized waters of hydration.

1                   17.    The gas generating device of claim 16 wherein the  
2 water-supplying compound comprises hydrated calcium oxalate.

1                    18.    An apparatus for inflating an inflatable device, said apparatus  
2 comprising:

3                    a closed first chamber having contents including a quantity of  
4 ammonium nitrate and a quantity of a fuel precursor, the fuel precursor being water  
5 reactive;

6                    an initiator in discharge communication with the contents of the first  
7 chamber for initiating decomposition of at least a portion of the quantity of ammonium  
8 nitrate to form water, with at least a portion of the formed water reacting with at least  
9 a portion of the quantity of fuel precursor to form a fuel material, said first chamber  
10 adapted to open when a predetermined increase in pressure within the first chamber  
11 is realized whereby at least a portion of the fuel material is emitted from said first  
12 chamber, and

13                    a second chamber containing a quantity of pressurized stored gas  
14 including a quantity of oxidant material, said second chamber in fluid communication  
15 with said first chamber upon the opening of said first chamber with at least a portion  
16 of the fuel material emitted from said first chamber reacting with at least a portion of  
17 the oxidant material to form inflation gas, said second chamber adapted to open when  
18 a predetermined increase in pressure within the second chamber is realized whereby  
19 at least a portion of the product gas is emitted from the second chamber to inflate the  
20 inflatable device.

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1            19. The apparatus of claim 18 wherein the first chamber contents  
2 include at least a portion of the quantity of water-supplying compound and at least a  
3 portion of the quantity of the fuel precursor stored in direct contact.

1            20. The apparatus of claim 18 wherein in an at rest condition, the  
2 quantity of water-supplying compound is stored segregated from the quantity of the  
3 fuel precursor within said first chamber.

1            21. The apparatus of claim 18 wherein the fuel precursor is at least  
2 one metal element-containing material selected from the group consisting of:  
3 hydrides, carbides, alkoxides and combinations thereof.

1            22. The apparatus of claim 18 wherein the fuel precursor comprises  
2 a metal alkoxide.

1            23. The apparatus of claim 18 wherein the fuel precursor comprises  
2 at least one first component selected from the group of metals and organometallic  
3 compounds and at least one second component selected from the group of carbonates  
4 and bicarbonates.

1                   24.    The apparatus of claim 18 wherein the fuel precursor comprises  
2   potassium t-butyl carbonate.

1                   25.    In a method for inflating an inflatable safety device via an inflator  
2   device wherein a fuel material reacts to form gas generation reaction products, the  
3   improvement comprising:

4                   heating a mixture containing at least a water-supplying compound and  
5   a water-reactive fuel precursor within the inflator device to form the fuel material in  
6   situ.

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1                   26.    The method of claim 25 additionally comprising:  
2                   contacting the formed fuel material with a quantity of compressed gas,  
3   the compressed gas including a quantity of oxidant,

4                   reacting at least a portion of the formed fuel material with at least a  
5   portion of the quantity of oxidant to produce heat,

6                   heating a stored quantity of inert gas with at least a portion of the  
7   produced heat to form an increased volume of gas and

8                   passing at least a portion of the increased volume of gas into the  
9   inflatable safety device to effect the inflation thereof.

1                   27.    The method of claim 25 wherein the fuel precursor is at least one  
2   metal element-containing material selected from the group consisting of:  
3                   hydrides, carbides, alkoxides and combinations thereof.

1                   28.    The method of claim 25 wherein the fuel precursor comprises a  
2   metal alkoxide.

1                   29.    The method of claim 25 wherein the fuel precursor comprises at  
2   least one first component selected from the group of metals and organometallic  
3   compounds and at least one second component selected from the group of carbonates  
4   and bicarbonates.

1                   30.    The method of claim 25 wherein the fuel precursor comprises  
2   potassium t-butyl carbonate.

1                   31.    The method of claim 25 wherein the water-supplying compound  
2   comprises ammonium nitrate.

1                   32.    In a vehicular inflatable safety assembly wherein a fuel material  
2   reacts to form gas generation reaction products, the improvement comprising:

3 the vehicular inflatable safety assembly containing a quantity of a  
4 water-supplying compound and a quantity of a water-reactive fuel precursor effective  
5 upon initiation to form the fuel material in situ.

1 33. The vehicular inflatable safety assembly of claim 32 wherein the  
2 fuel precursor is at least one metal element-containing material selected from the  
3 group consisting of:

4 hydrides, carbides, alkoxides and combinations thereof.

1 34. The vehicular inflatable safety assembly of claim 32 wherein the  
2 fuel precursor comprises a metal alkoxide.

1 35. The vehicular inflatable safety assembly of claim 32 wherein the  
2 fuel precursor comprises potassium t-butyl carbonate.

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